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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/064,756

08/14/2002

Douglas P. Boyd

12591-2

9667

23446

7590

07/28/2004

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EXAMINER

QADERI, RUNA S

ART UNIT

PAPER NUMBER

3737

DATE MAILED: 07/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,756

Applicant(s)

BOYD ET AL.

Examiner

Runa S. Qaderi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 9, 10, 13, 14, 16, 17, 20, 21, 24, 25, 27, 28, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyd et al. (US 4,352,021).

Boyd et al. (hereinafter Boyd) discloses a method of performing a high speed computed tomography scans of arteries, cavities, moving organs or the like. With regards to claims 1, 5, 6, 10, 13, 14, 21, and 25 the method steps of Boyd include monitoring the heart via echocardiogram, scanning the region via trigger by the a physiological signal from the heart, successively scanning based on trigger signals of successive or every other heart beat, and constructing cine-like images of a single transverse section, column 5 line 54 through column 6 line 14. The scan includes the step of sweeping an electron beam along a target ring and thereafter an x-ray fan beam is used to obtain the CT image, fig. 3. The recitation of Boyd to a patient couch supported by a movable gurney in order to vary the angle of the body axis with respect to the scanner axis, column 5 lines 41-47, satisfies the step of moving the patient with respect to the CT scanner between or during CT scans.

The method steps of successive scans repeated on every other beat of Boyd satisfies the limitations to claims 3, 16, 24, and 27 because this step includes at least two consecutive CT scans beginning at different points within a time period over two or more cardiac cycles.

The disclosure to a scanning speed of 25 or 50 milliseconds, column 6 lines 2-6, satisfies the step of performing a complete CT scan in no more than 100 milliseconds as claimed in 4, 17, and 28.

According to the applicant's definition of "prospective" gating, specification page 2, the triggering scheme of Boyd is prospective in that the scan is triggered by EKG signal thereby satisfying the limitations to claims 9, 20, and 31.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 12, 15, 23, 26, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. (US 4,352,021) in view of Slack et al. (US 6,393,091).

Boyd teaches the discloses method as discussed above except for the performing steps of obtaining said at least two CT scans during a single cardiac cycle and obtaining multiple parallel CT slices from separate parallel rows of detectors in CT the CT scanner. Slack et al. (hereinafter Slack) discloses a method of cine cardiac scan with computed tomography. The method includes the step of obtaining at least two CT scans during a single cardiac cycle as shown in figure 2 and discussed in column 4 lines 19-27 and the step of multi-slice scanning via detector array as discussed in column 2 lines 27-29 of Slack. It would have been obvious to one of ordinary skill in the

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art at the time the invention was made to combine the teachings of Boyd with Slack thereby satisfying claims 2, 12, 15, 23, 26 and 33 of applicant because a cine image of the desired region of the patient is produced from optimized collection of the cardiac phase images. The resulting images have improved temporal resolution by avoiding oversampling and undersampling of the cardiac phases as taught by Slack.

Claims 7, 8, 18, 19, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. (US 4,352,021) in view of Richey et al. (US 4,547,892).

Boyd teaches the discloses method as discussed above except for the steps of combining a series of three dimensional images into three dimensional cine loop based on said at least two CT scans and displaying a series of moving three dimensional images based on said at least two CT scans. Richey et al. (hereinafter Richey) discloses a method of ECG gated cardiac imaging with CT scanner. The method include the steps of combining the images to produce and display a movie of the patient's heart, column 5 lines 41-49. The combination of the images to produce a movie entails that the images are three-dimensional. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Boyd with Richey thereby satisfying applicant claims 7, 8, 18, 19, 29, and 30 because it provides a more thorough diagnosis of the heart as taught by Boyd.

Claims 11, 22, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boyd et al. (US 4,352,021) in view of Heuscher et al. (US 6,154,516).

Boyd teaches the discloses method as discussed above except for the step of moving the patient with respect to the CT scanner during each of said at least two CT scans to obtain spiral scans and. Heuscher et al. (thereafter Heuscher) discloses a method of ECG gated cardiac images with spiral CT scanner. The method includes the step of translating the patient on a patient support through the examination region in the z-direction while the source emitting a beam of radiation is rotated such that source follows a helical path relative to the patient, column 2 lines 1-13. The translation of the patient entails moving the patient with respect to the CT scanner during each of said at least two CT scans to obtain spiral scans. The combination of Boyd in view of Heuscher to satisfy applicant claims 11, 22, and 32 would have been obvious to one of ordinary skill in the art at the time the invention was made because it reduces the scan time which is a desired advantage taught by both references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Runa S. Qaderi whose telephone number is (703) 605-4285. The examiner can normally be reached on M-F 9:00-5:30.

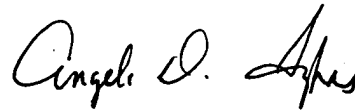
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela D. Sykes can be reached on (703) 308-5181. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



RSQ



**ANGELA D. SYKES
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